Transition: Re- thinking Textiles and Surfaces

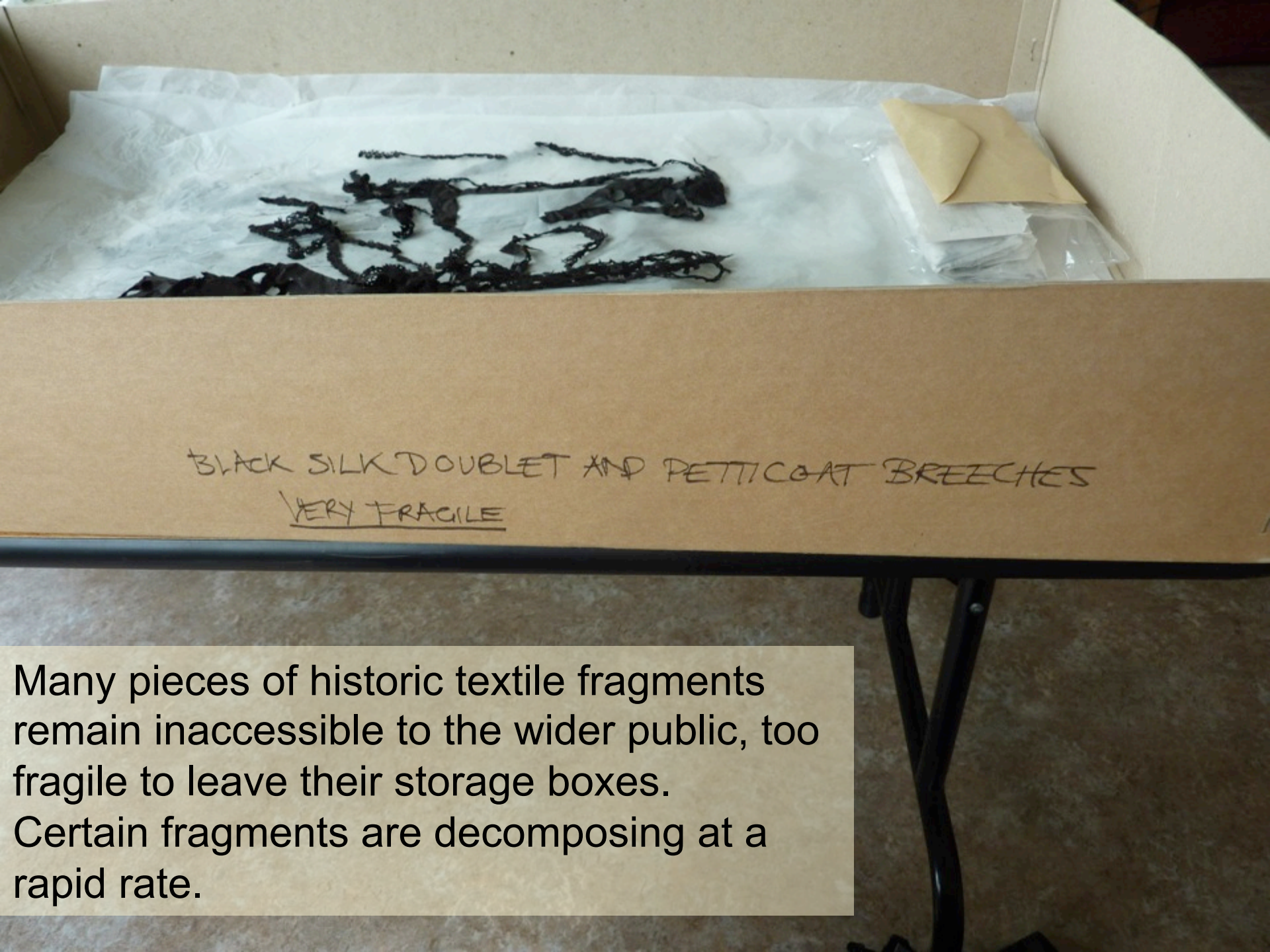
University of Huddersfield

Powerpoint Presentation Nov 2014

Digital 3D Reconstruction of Historical Textile Fragment

Sophie Calvert, Dr. Jess Power
Dr. Paul Bills, Dr. Helen Ryall

Presented by Sophie Calvert
s.calvert@hud.ac.uk



Many pieces of historic textile fragments remain inaccessible to the wider public, too fragile to leave their storage boxes. Certain fragments are decomposing at a rapid rate.

Project Overview
Aims

- To use photography and 3D scanning techniques to analyze a historic textile fragment
- To accurately record data and explore a methodology suitable for handling and testing historic textiles

Digital 3D Reconstruction of
Historical Textile Fragment

Project Overview
The Fragment

- Analyzing textile fragments from the English National Trust Archive
- Fragments examined in this study loaned from Claydon House archive, Buckinghamshire
- Textiles date back to 1625c
- Fragments examined are part of a decorative mens recticella lace collar

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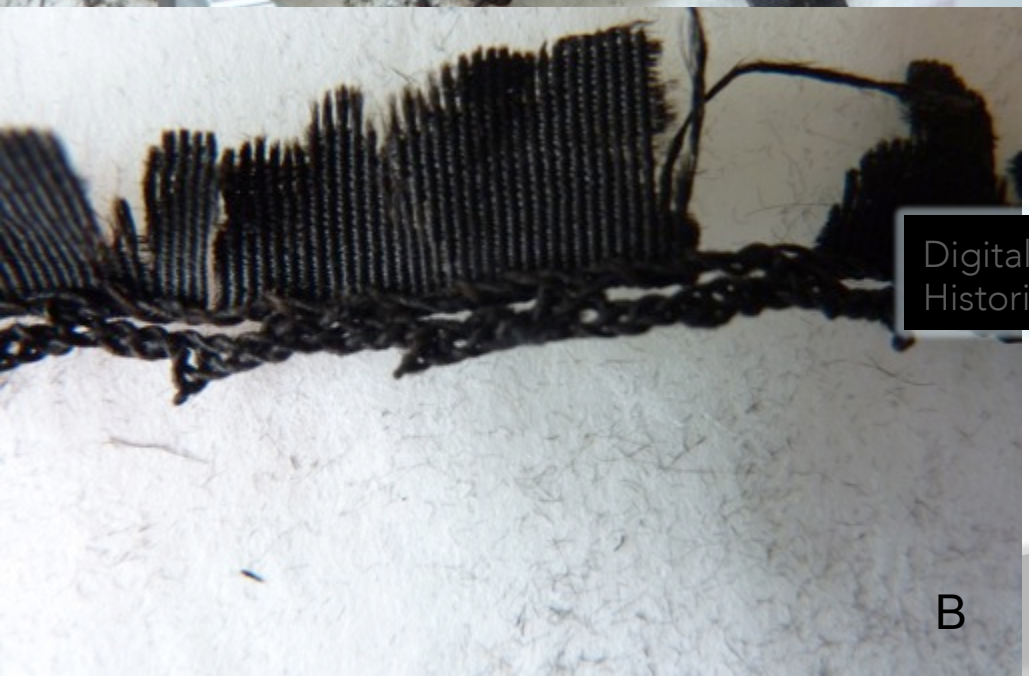

Project Overview
The Fragment

- A- Detail of the lace decorative collar
- B- Detail of the silk trim (seen at the base of the collar)

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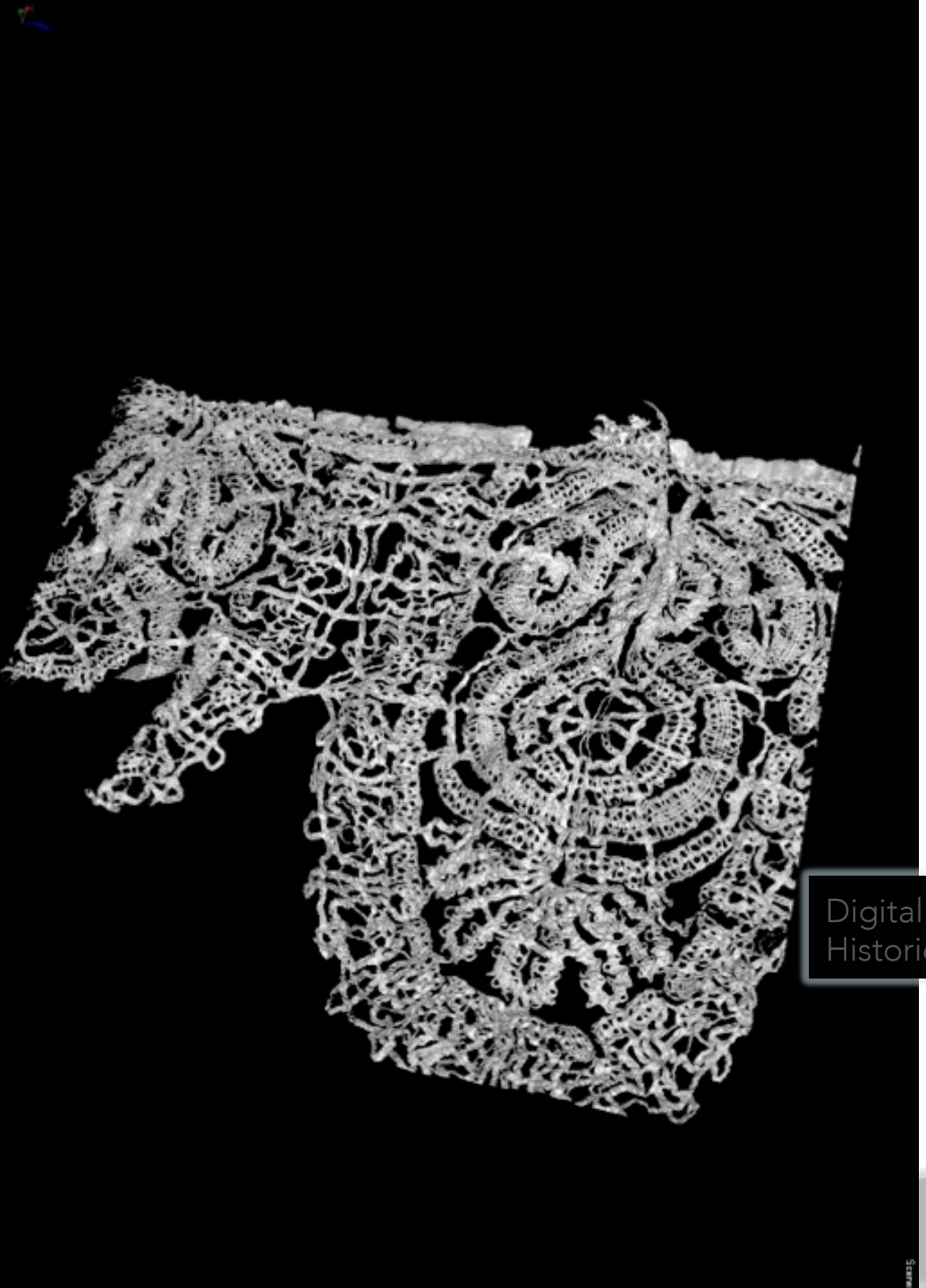

Digital 3D Reconstruction of Historical Textile Fragment

Computerized Tomography Scan (CT)

- Used to determine 3D yarn architecture
- Instrument used in this study- Nikon Metrology 225 Micro CT Scanner
- Each Scan contained 1583 frames which were constructed using Nikon Metrology Software


Computerized Tomography Scan (CT)
CAUTION
X-RAYS PRODUCED WHEN ENERGISED
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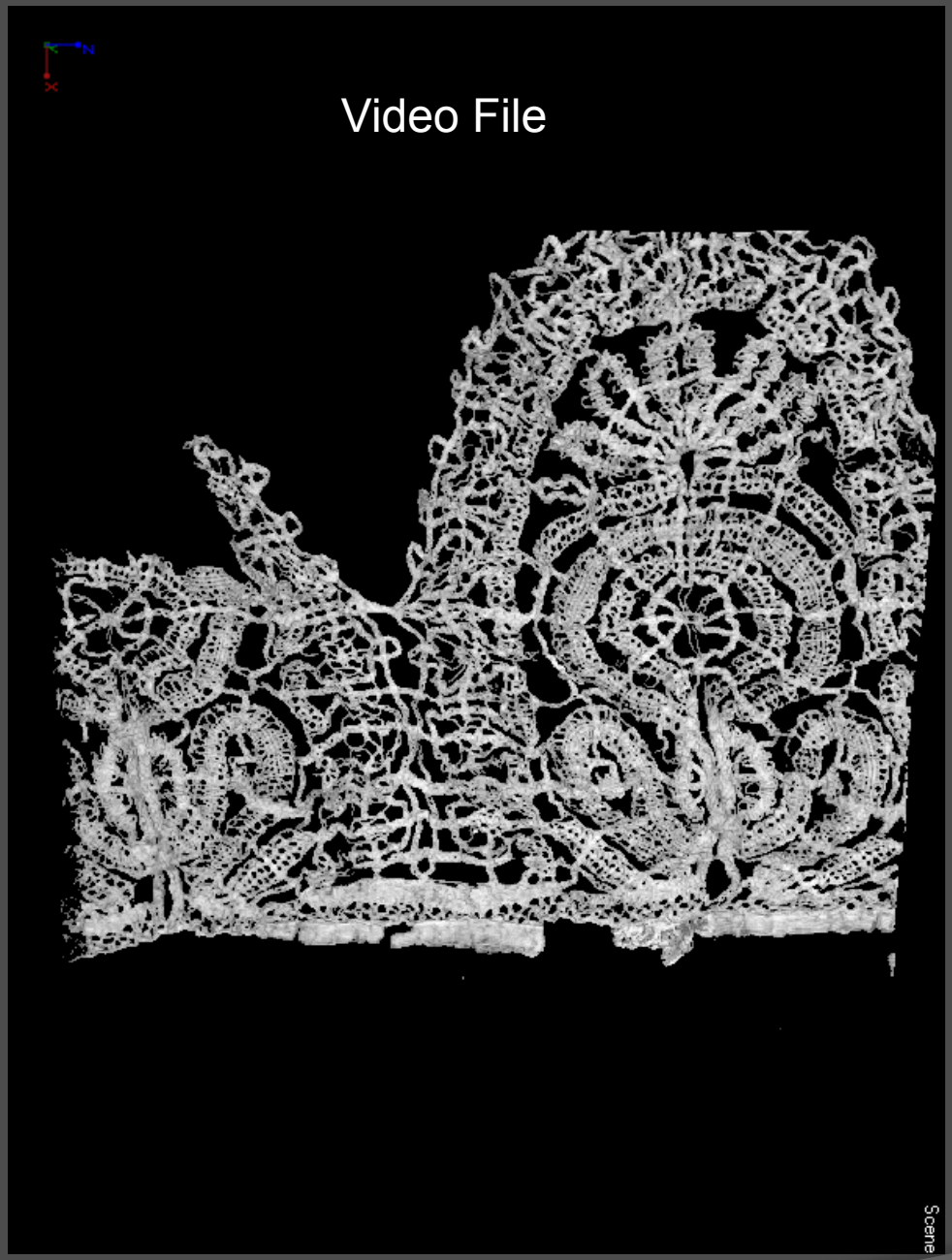
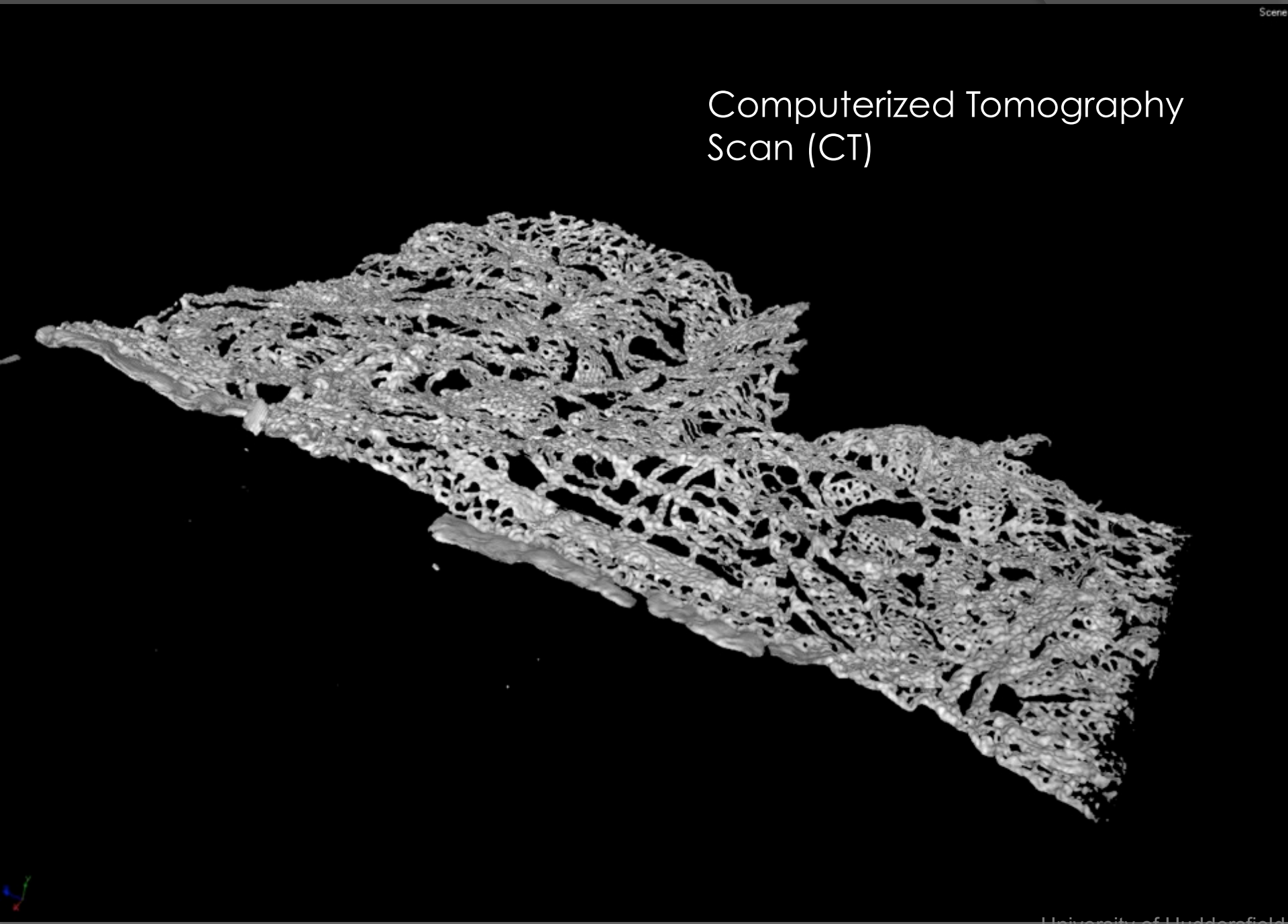
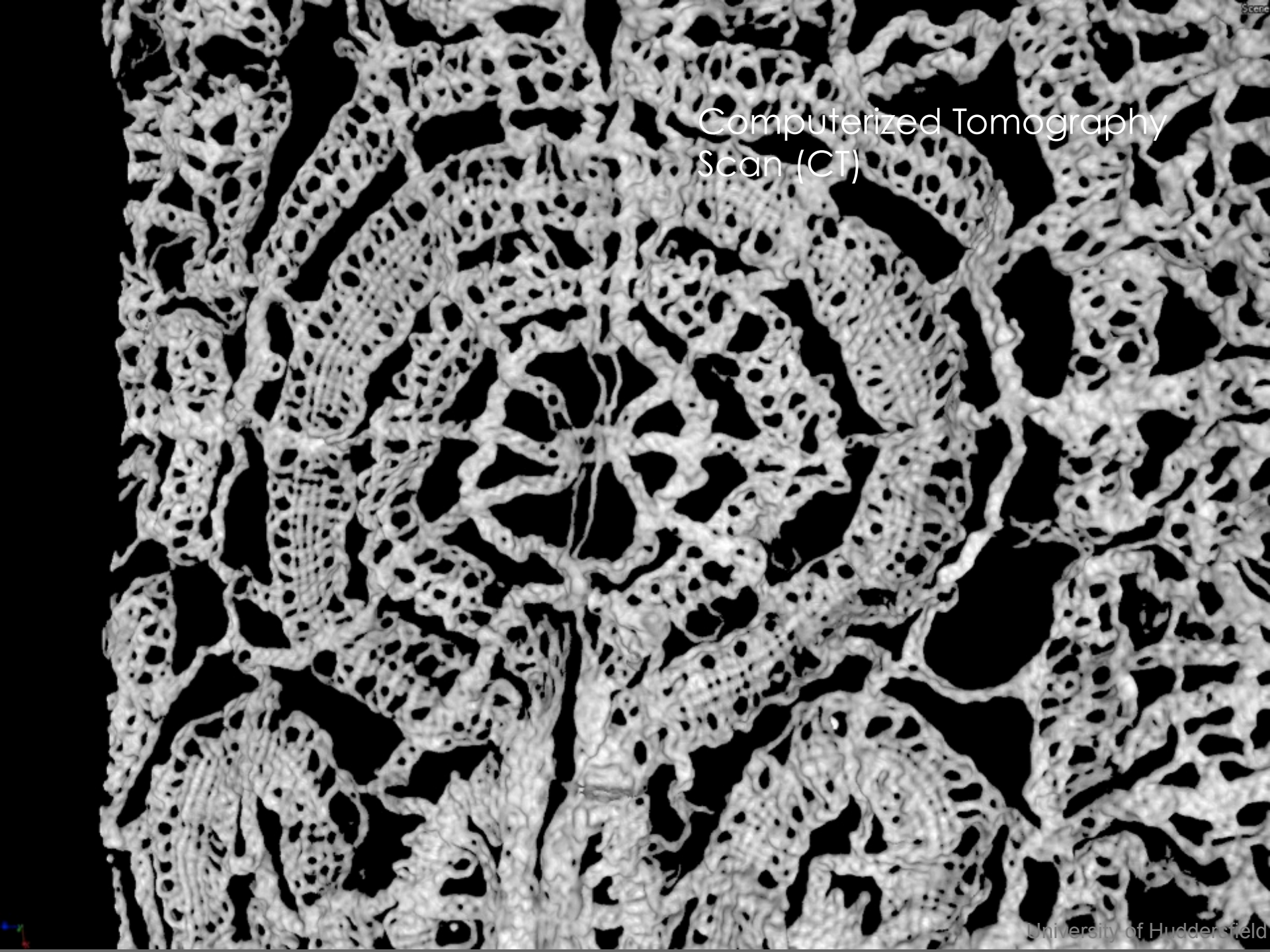
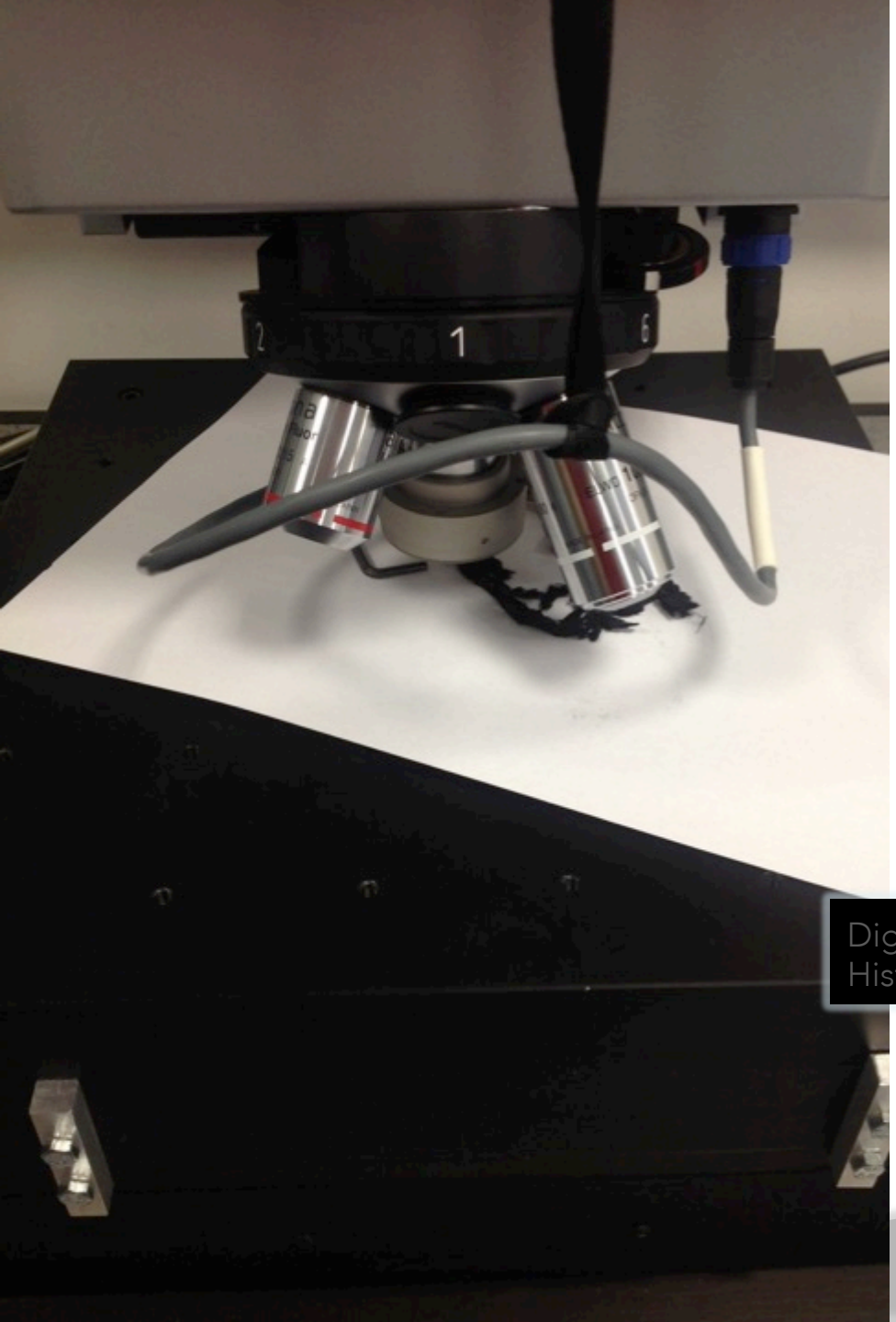


Computerized Tomography Scan (CT)


Computerized Tomography
Scan (CT)


Computerized Tomography
Scan (CT)



Infinite Focus Microscopy (IFM)

- Used to determine surface and yarn measurement and structure
- Objective Lense provides small depth of focus to combine with vertical scanning to capture point height and true colour surface data

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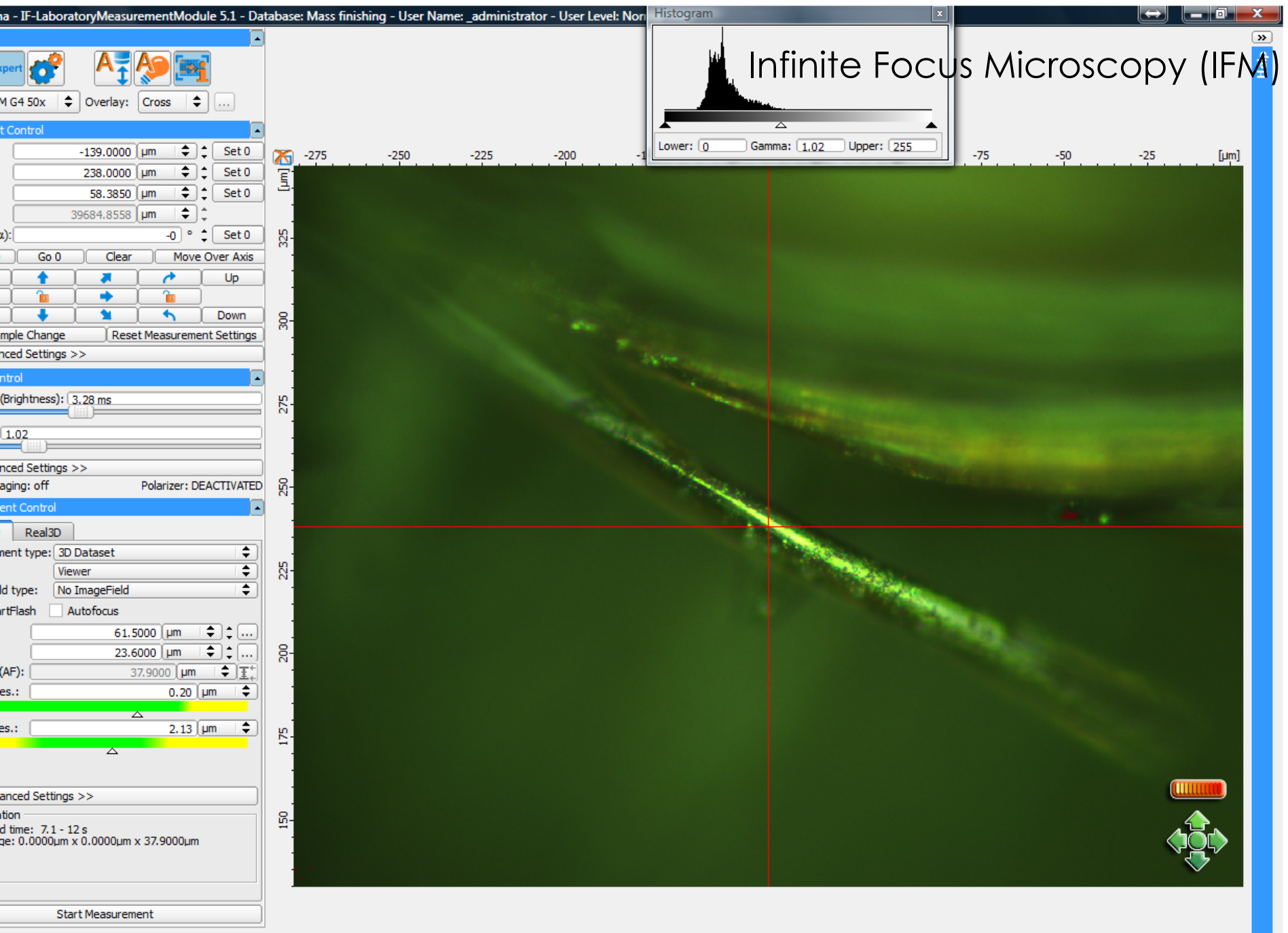
Infinite Focus Microscopy (IFM)



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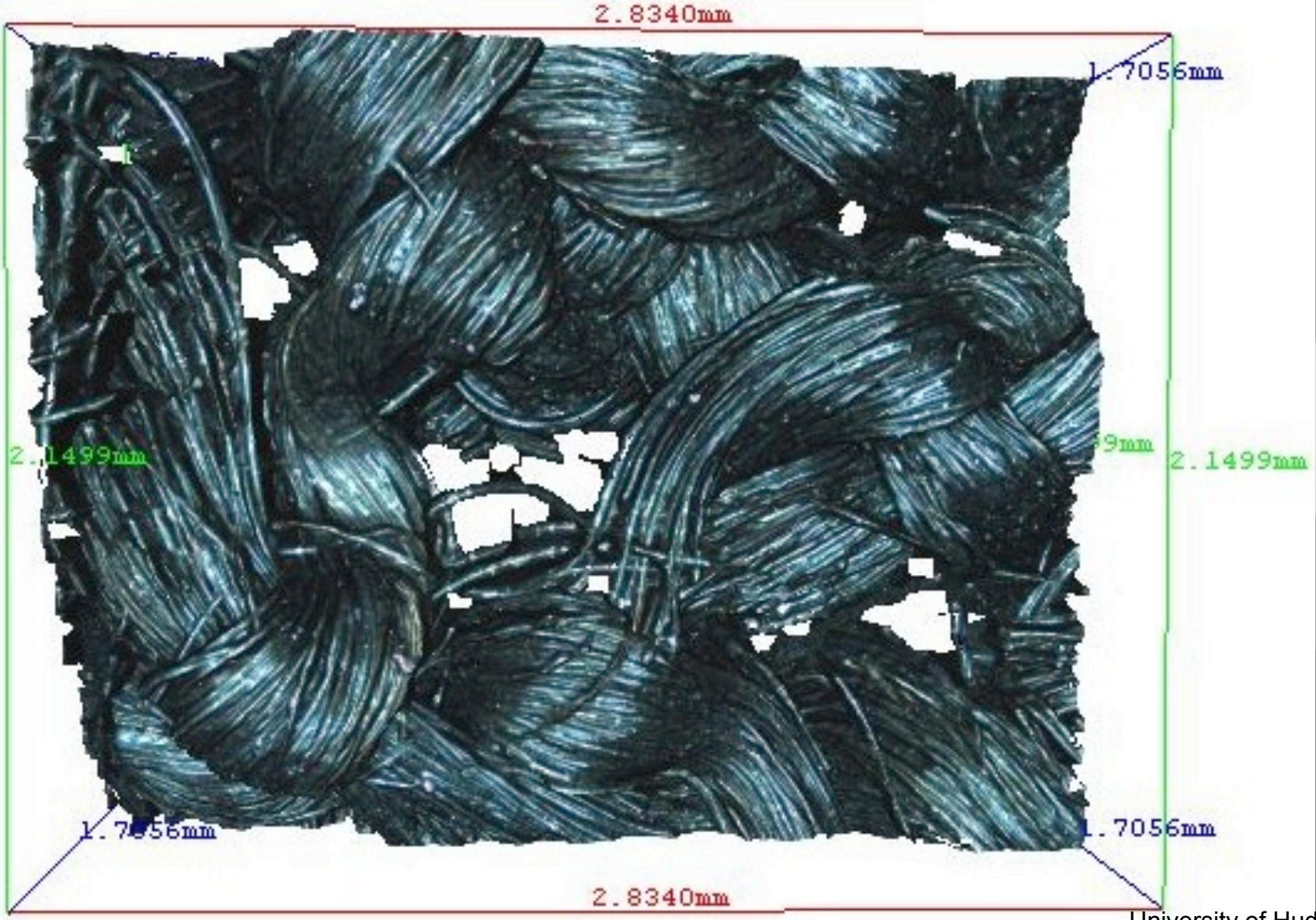

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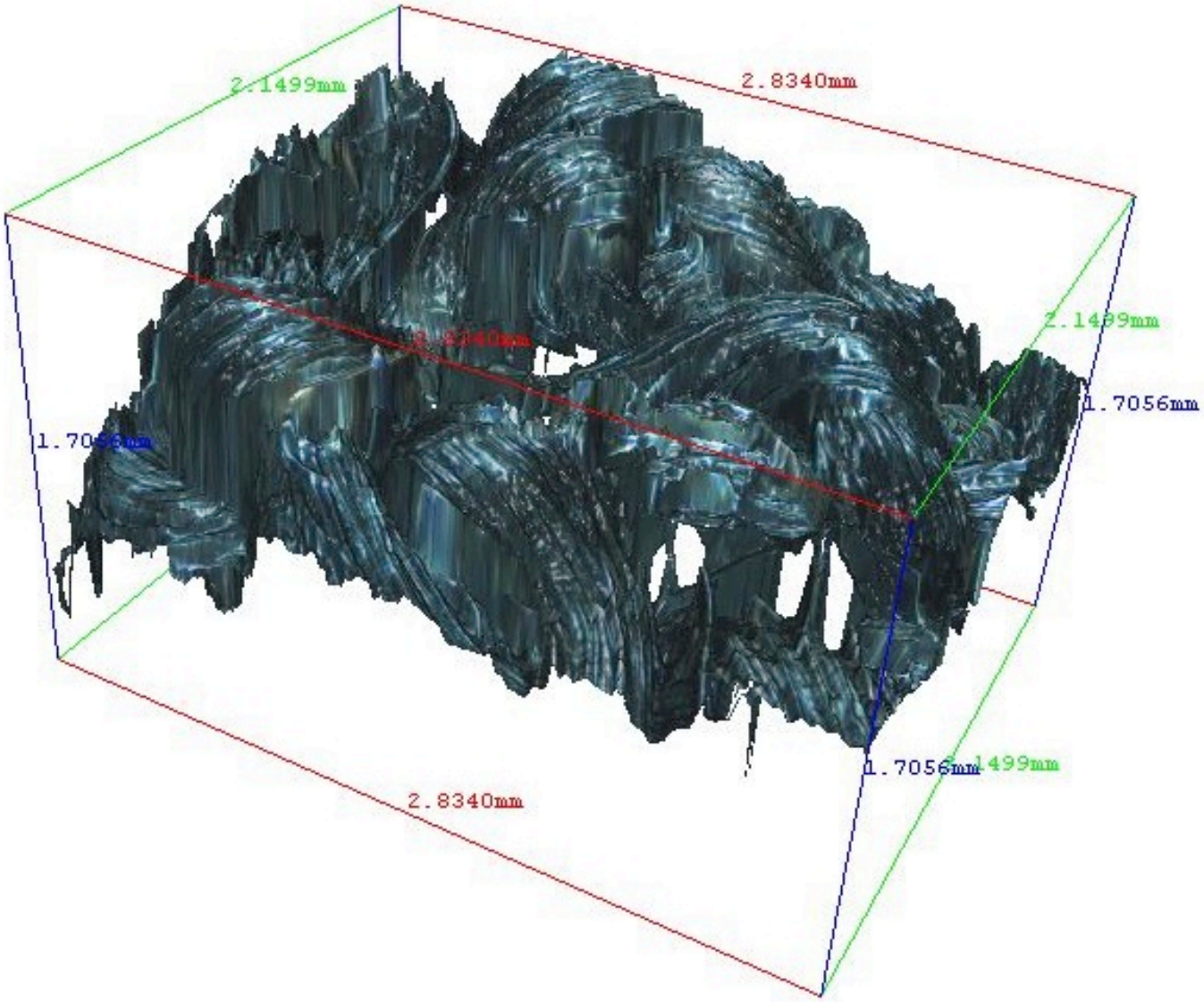

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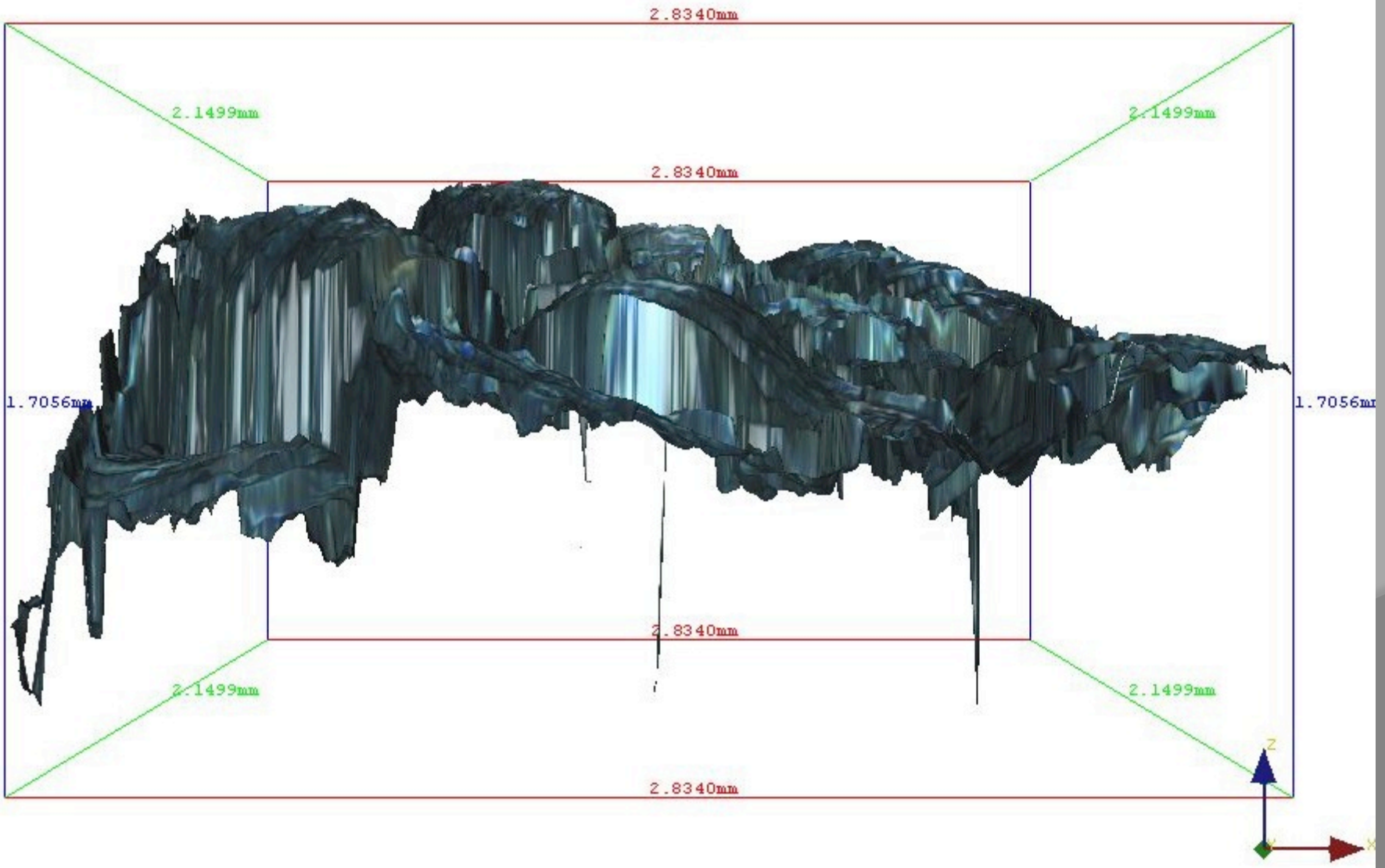

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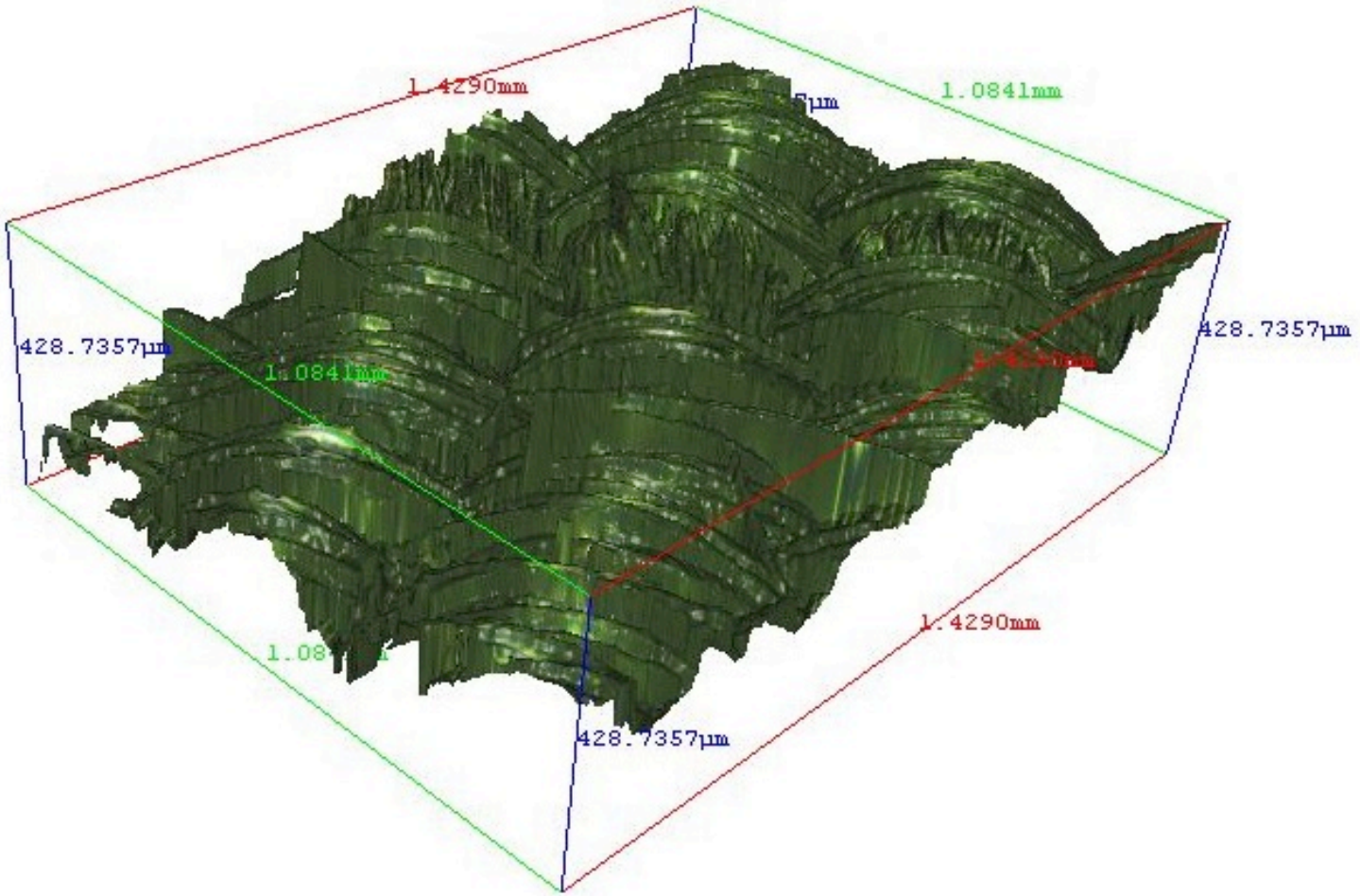

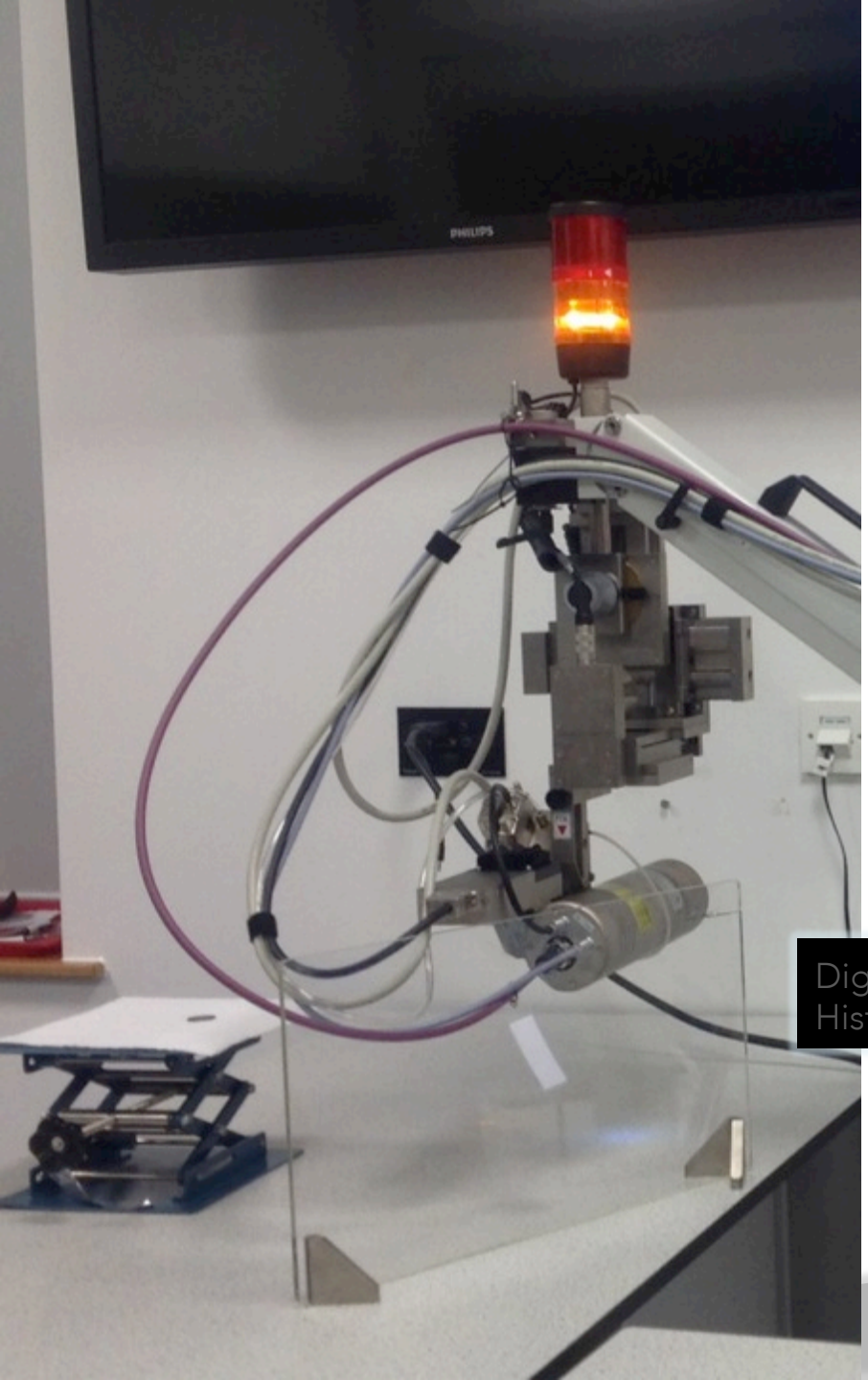

X-Ray Florescence (XRF)

- Used to determine constituent elements including possible links to dye process
- Qualative and semi quantitative Xray Florescence measurements were performed on different areas of the textile fragments
- Instrument used in this study- A commercially available Bruker Artax 400 XRF

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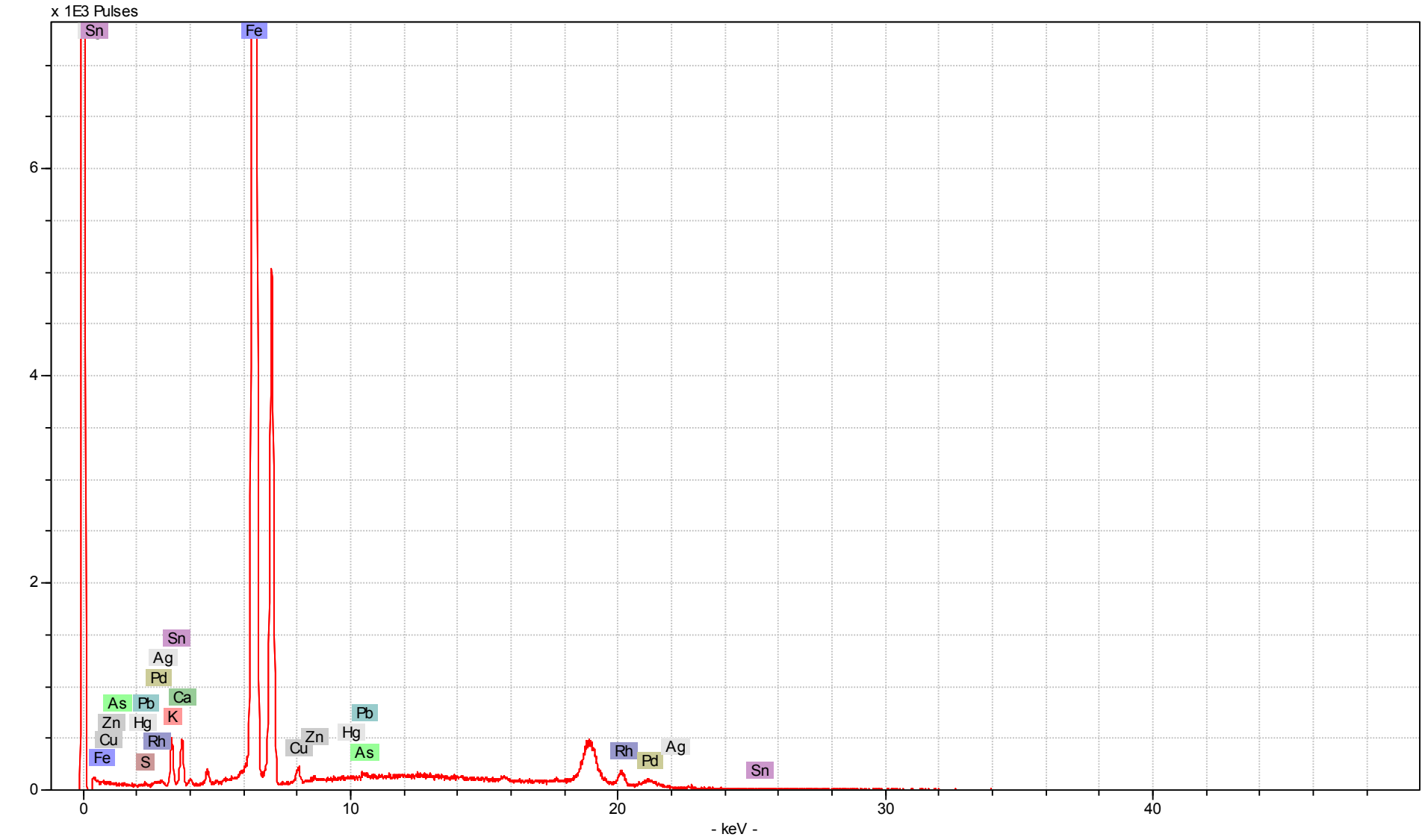
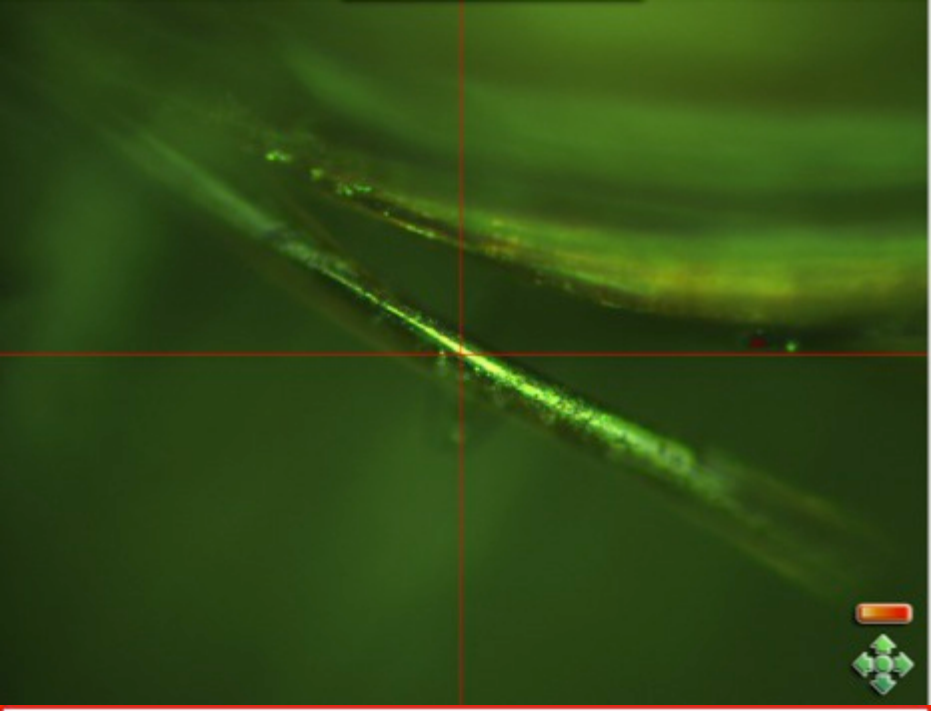
X-Ray Florescence (XRF)



Credits: Working the XRF for this project Professor Sue Kilcoyne



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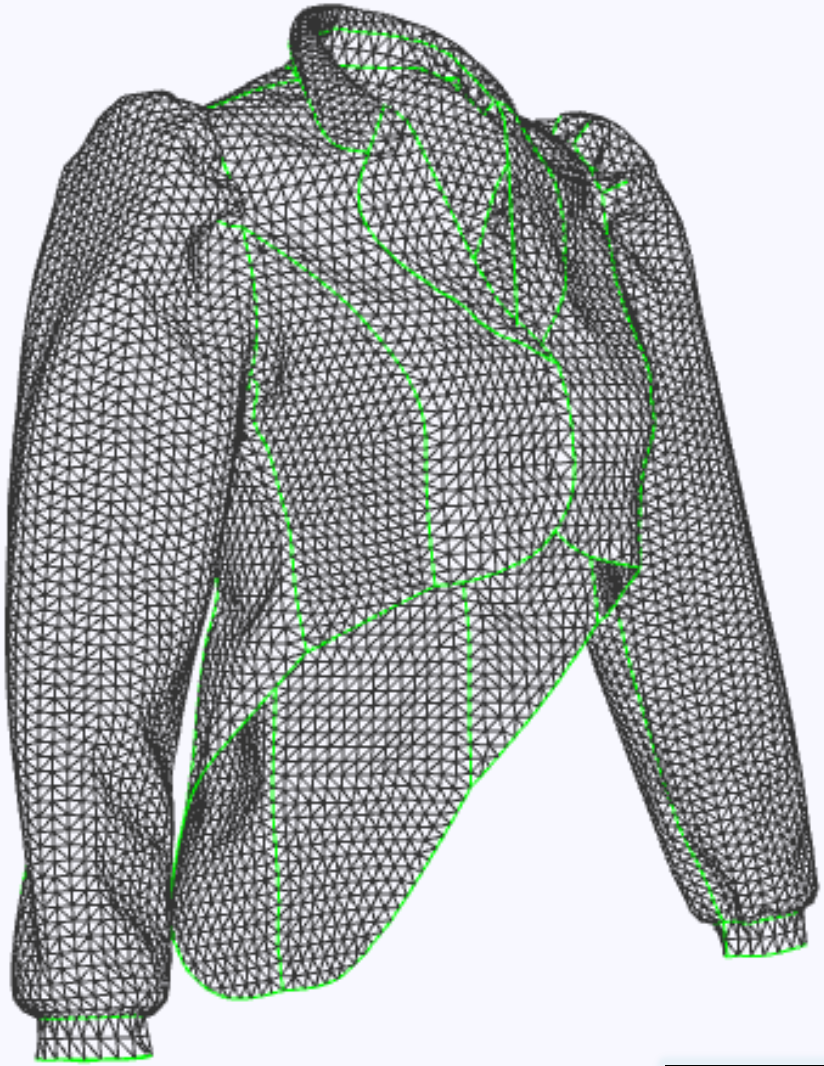
Conclusions

- Research has demonstrated the potential of (CT), (IFM) and (XRF) 3D scanning technique to examine both structure and fibre of historic textile fragment
- These methods non destructively unlock the data and detail which in time would fully disintegrate with the textile
- Data collected will be used within 3D software packages for advanced textile simulation modelling purposes

Further Research



- A range of software currently exists which takes 3D scan imagery such as the CT data within this study into reconstruction including; MATALAB, Rhinoceros, ANSYS.
- Current 3D specialist textile software work with a range of assumed fabric properties unsuitable for historic textile modeling
- A digital catalogue of data will be collated specific to historic textile fragments which will include further fabric testing procedures.

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